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XXVI.—*On a Hybrid between a male Guinea-fowl and a female Domestic Fowl, with some Observations on the Osteology of the Numididæ.* By FRANK E. BEDDARD, M.A., F.R.S.

SOME time since Mr. Selater received as a present from Dr. Goeldi, C.M.Z.S., of Pará, a living example of a hybrid between the two gallinaceous birds mentioned in the title of this communication. It was stated to have been obtained from Ceará, Brazil, where, it is said, such hybrids are often bred and are known by the name of *Tuhý*. After some weeks the bird was killed and a stuffed skin made of it. The body, *minus* the skull, the wings, and the distal part of the hind wing (which were left in the skin), Mr. Selater has kindly allowed me to examine and study.

It was remarked* of the living bird that it presented the general appearance of a Fowl with traces of the casque and wattles of the other parent. I may add, from an examination of the stuffed skin, that the hybrid presented a further likeness to *Gallus* by reason of the absence of the spurs—the bird being, as determined by myself, a male. The general appearance was undoubtedly that of a Fowl; there were, for instance, no observable traces of the peculiar plumage of *Numida*. But the voice, when it cried out, was unmistakably like that of a Guinea-fowl.

There are not wanting accounts of hybrids between these

* See P. Z. S. 1898, p. 348.

two genera; and since, so far as I am aware, the only species of Guinea-fowl which is likely to be in a position to pair with the Common Fowl is *Numida meleagris*, the following observations apply to that species.

In 1865 the late Dr. v. Willemöes-Suhm * described, but only as regards external characters, a hybrid between these two birds. Later, M. Trutat † directed attention to a similar cross, figuring the bird itself and a few feathers.

Another case is recorded by M. Malafosse in the same publication as that which contains the last-quoted note (in the vol. for 1873-74).

In 1877 M. Barac again called attention to the subject ‡, dealing, however, as did the last-quoted observers, entirely with external characters and habits; in this communication is to be found a useful bibliography of the subject of hybrids between the two birds.

So far as I am aware, all these papers deal with external characters only, and the general result appears to be that the hybrids are intermediate in their appearance between their two parents.

I am also quite in harmony with these observers; the skeleton and the windpipe, which I have myself examined, are perfectly intermediate in their characters between those of *Numida* on the one hand and *Gallus* on the other.

But, in order to indicate the features in which the hybrid is intermediate, it will be necessary to compare with each other the two genera *Gallus* and *Numida*. This has been already done as regards certain points by Huxley §. I will attempt, however, in the following pages a somewhat more detailed comparison than is to be found in his memoir cited below. I shall take the various regions of the skeleton singly and in order. I commence with

* "Ein Bastard von *Numida meleagris* und *Gallus domesticus cochinchinensis*," J. f. O. 1865, p. 433.

† Bull. Soc. d'Hist. Nat. Toulouse, x. (1875).

‡ "Bastarde von Haushahn und Perlhenne," Mitth. orn. Ver. Wien, 1877, pp. 35, 43.

§ "On the Classification and Distribution of the Alectoromorphæ and Heteromorphæ," P. Z. S. 1868, p. 294.

§ *The Vertebral Column.*

Both *Numida* and *Gallus* possess 16 cervical vertebræ, and in both the 16th is fused with the three following dorsals. The only differences that were apparent to me in the vertebral column concern the sacrals and the free caudals.

In *Numida* there are two vertebræ which may be termed sacral, and which possess stout and subequal transverse processes supporting the ilia. The two vertebræ in question are the third and fourth after that which bears the last free rib. In *Gallus*, on the other hand, there is only one vertebra in this region with specially strongly developed transverse processes; this one corresponds to the first of the two in *Numida*: *i. e.*, it is the third after that which bears the last free rib. There follow in *Numida* 12 vertebræ closely attached to the pelvis, and six free caudals exclusive of the compound "ploughshare"-bone*. I should remark, however, that in *Numida meleagris* the last of these is only partially free; it is almost fused with the ploughshare-bone. In *Gallus* there are 11 vertebræ attached to the pelvis and to each other, followed by only five free caudals, in addition, of course, to the ploughshare-bone.

§ *The Skull.*

There are two obvious points which distinguish the skull of *Gallus* from that of *Numida*. In *Gallus* there are both a large postfrontal and a large squamosal process; these two unite at their extremities. In *Numida* there is an equally well-developed postfrontal process, but no squamosal process at all.

The nasal processes of the premaxillæ in *Gallus* are comparatively broad, and do not extend so far back upon the forehead as do the much narrower processes of certain species of *Numida*. In addition to these two points it may be

* The difference shown in the two genera in the number of the free caudals is not, however, universal: for in a skeleton of *N. vulturina* I have found, as in *Gallus*, only five free vertebræ, the last being fused with the pygostyle.

remarked that the skull is wider between the orbits in *Numida*, and that the bony nostrils in that genus are longer than in *Gallus*. These observations, however, apply to the section *Guttera*. In *Numida* proper (see p. 341) the conditions are more like *Gallus*.

§ *The Pelvis.*

As Prof. Huxley has pointed out, "the posterior angles of the ilia are produced beyond the level of the last sacral vertebra" in *Gallus*. In one of the specimens which I have examined they extend as far back as to the level of the third free caudal; in the other only to the second. *Numida*, on the other hand, has a decidedly truncated posterior margin, which in the species *N. cristata* and *N. eduardi* is very Tetraonine in appearance. In *N. meleagris*, *N. vulturina*, and *N. ptilorhyncha** the posterior margin of the ilia are not by any means so broad and truncated, and thus present a closer resemblance to the pelvis of *Gallus*, though the processes of the two bones are not nearly so prominent.

The prepubic process of *Numida* is by no means so long as is that of *Gallus*; in *Gallus*, moreover, there is a long bony junction between the pubis and the ischium, which is wanting in *Numida*. Finally, the obturator foramen seems to be constantly more extensive in *Numida*.

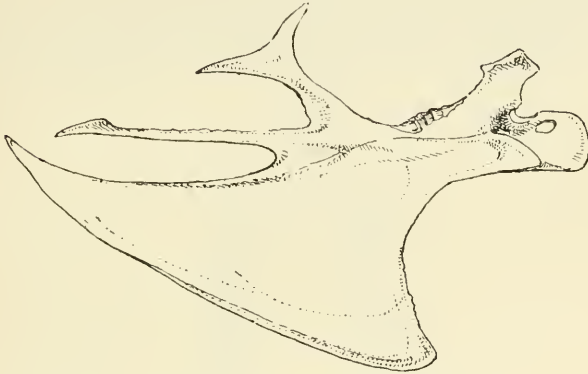
§ *The Sternum.*

The sternum of *Numida* (fig. 1, p. 337) differs from that of *Gallus* (fig. 2) in a considerable number of small points. As was mentioned by Prof. Huxley, *Numida* is characterized by "the obtuseness and somewhat outward inclination of the costal processes" (= "anterior lateral processes" of more recent nomenclature). I may add to this that the processes in question are generally broader in *Numida* (not, however, in a young example of *N. meleagris* which I studied), and, when the sternum is viewed laterally, are seen to lie nearly at right angles with its long axis. In *Gallus* the processes

* For complete skeletons of these three species I am indebted to Mr. E. Gerrard, who kindly allowed me the use of them.

are narrower and lie almost parallel with the coracoids; they are also somewhat hooked at the free end. In *Gallus* the

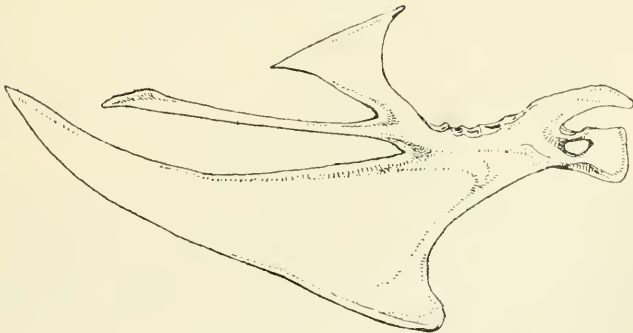
Fig. 1.



Sternum of *Numida vulturina*.
(Lateral view, $\frac{2}{3}$ nat. size.)

posterior lateral processes consist of two divergent pieces of bone—also known respectively as the external and internal xiphoid processes—which spring from the sternum by a

Fig. 2.

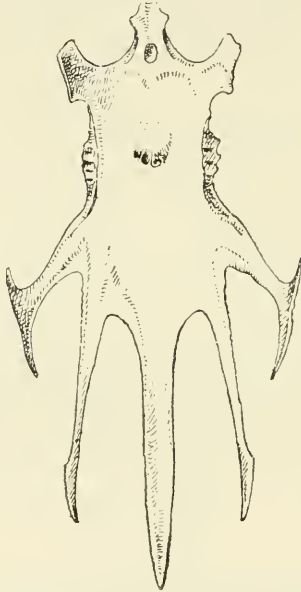


Sternum of *Gallus bankiva*.
(Lateral view, $\frac{2}{3}$ nat. size.)

common narrow bar of bone. The arrangement characteristic of *Numida*, as will be seen from the accompanying figure

(fig. 3), is a little different, and nearer to that of the Peristeropodes. There is no narrow neck (with an exception which will be noted immediately) uniting the two portions of the posterior lateral process; they seem, as it were, to arise separately from the body of the sternum. The Guinea-fowl's sternum is thus broader in this region than that of *Gallus*. But I should remark that one of the two examples

Fig. 3.



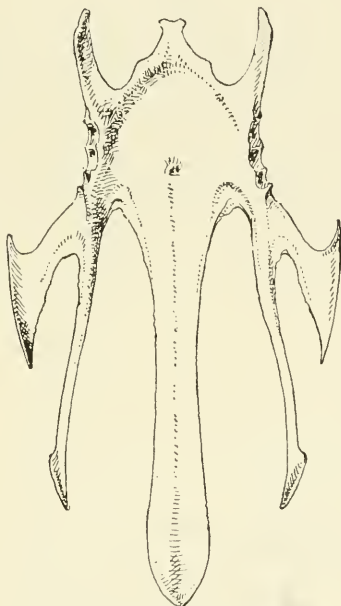
Sternum of *Numida vulturina*.
(Dorsal aspect, $\frac{2}{3}$ nat. size.)

of *Numida meleagris* which I studied (a young hen) presented a sternum which in the particular just mentioned was precisely like that of a Common Fowl. This, however, was probably due to incomplete ossification, which might, later, have broadened the "neck."

The form of the carina sterni differs among the Guinea-fowls: in *N. cristata* and *N. eduardi* (which are sometimes spoken of as the genus *Guttera*) the anterior margin is much more cut away than in the remaining species, to make room

for the swollen extremity of the furcula, which lodges a loop of the windpipe; but in all Guinea-fowls the carina seems to be deeper than in *Gallus* (see figs. 1, 2, p. 337). In gallinaceous birds generally, as is well known, the spina externa and the spina interna sterni unite to form a broad, or rather deep, plate of bone in which the sternum ends anteriorly. This is perforated below by a foramen, through which pass

Fig. 4.



Sternum of *Gallus bankiva*.
(Dorsal aspect, $\frac{2}{3}$ nat. size.)

the inner edges of the coracoids. The form of the manubrium differs in different Guinea-fowls: in the two species which are referred to the genus *Guttera* the manubrium is longer and with a more sinuous outline, ending in front in a more pointed extremity. In *N. meleagris*, *N. vulturina* (fig. 1, p. 337), *N. nitrata*, and *N. ptilorhyncha* it is shorter and squarer; and, moreover, the upper face of its base is perforated by a conspicuous pneumatic foramen, which latter is

wanting in *N. cristata* and in its immediate ally, *N. eduardi*. Except for the absence of this foramen the manubrium sterni of *Gallus* comes nearest to that of *N. vulturina*, &c. Another feature which seems to distinguish the sternum of *Gallus* from that of *Numida* is in the attachment of the sternal ribs. In all the species of *Numida* that I have examined, which comprise all those mentioned in the course of this paper (with the exception of *N. meleagris*), there are, as in *Gallus*, four sternal ribs with attachments to the sternum. Of these the last three are crowded together, the first rib being at some little distance in front of this group of three. In *Gallus*, on the other hand, there is a progressive diminution in the distances between the sternal articular surfaces of the ribs from before backward.

A final characteristic which differentiates the sterna of *Gallus* and *Numida* is the breadth of the anterior region, which is much wider in *Gallus*. The following measurements are taken at the insertion of the second pair of ribs:—

	Length. millim.	Breadth. millim.
<i>Gallus bankiva</i>	117	35
" " 	112	33
<i>Numida nitrata</i>	115	25
" <i>vulturina</i> *	108	28
" <i>cristata</i>	121	27
" <i>eduardi</i>	130	28
" <i>meleagris</i>	113	25
" <i>ptilorhyncha</i>	105	25

§ *The Scapula and the Clavicle.*

Prof. Huxley has directed attention to the fact that the acromion is recurved in a hook-like fashion in *Numida*, and that it is not in *Gallus*. The existence in *Numida cristata* and *N. eduardi* of a hollow enlargement of the conjoined ends of the clavicles is well known. This, of course, does not exist in *Gallus*. I may point out that in those species of *Numida* with an inflated box the two clavicles are disposed in a direction more parallel to each other, and are not bowed

* Slightly distorted at the extremity.

outward in an U-shaped fashion as they are in *N. mitrata* &c. *Gallus* is naturally more like the latter in this feature.

§ *The Fore Limb.*

The only detectable difference of note has already been pointed out by Prof. Huxley. This is the absence in *Numida* of a backward process of the second metacarpal. It is to be found in *Gallus* as in Gallinaceous birds generally.

It may be convenient, perhaps, before proceeding to consider the osteology of the hybrid Guinea-fowl, to abstract from the foregoing a tabular statement of the differences between the species of the genus *Numida*, which allow it to be divided, at any rate, into subgenera. The characters of *Numida* proper and *Guttera* will be then as follows :—

GUTTERA (including the species *cristata*, *eduardi*, *pucherani**) :—

Trachea convoluted in both sexes and received into a bony dilatation of the clavicular symphysis.

Sternum without pneumatic foramen at base of manubrium, the carina much cut away anteriorly.

Ilia squarely truncated behind.

Nasal processes of premaxillæ very long.

NUMIDA (including the species *vulturina*, *mitrata*, *ptilorhyncha*, *meleagris*) :—

No convoluted trachea or bony box upon the clavicles.

Sternum with pneumatic foramen at base of manubrium, the carina not much cut away anteriorly.

Ilia with slightly developed posterior processes.

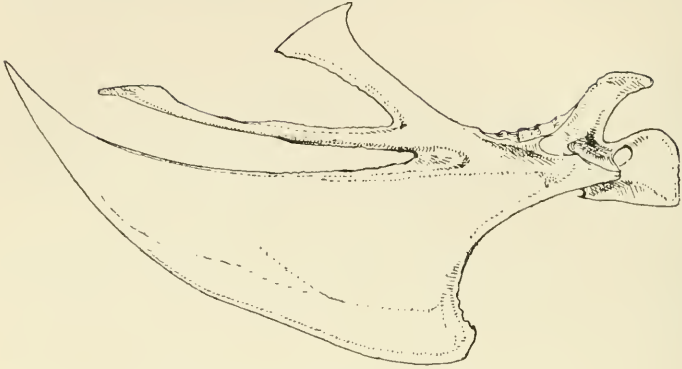
Nasal processes of premaxillæ not so long as in *Guttera*.

§ *Osteology of the Hybrid.*

Unfortunately, as already stated, several important regions of the hybrid were wanting, so that my comparisons are not so complete as I could wish. In the vertebral column the only diagnostic feature which I was able to observe concerns the sacral vertebræ. Here, as in *Numida*, the third and fourth vertebræ after that bearing the last rib were

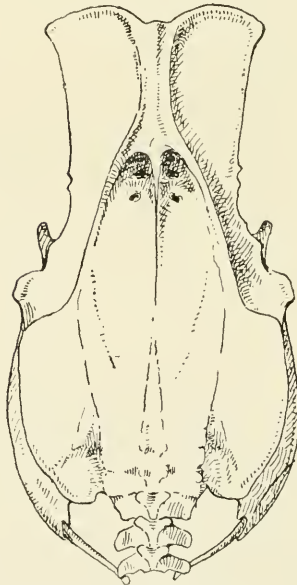
* Cf. W. A. Forbes, P. Z. S. 1882, p. 347.

Fig. 5.



Sternum of Hybrid Guinea-fowl.
(Lateral view, $\frac{2}{3}$ nat. size.)

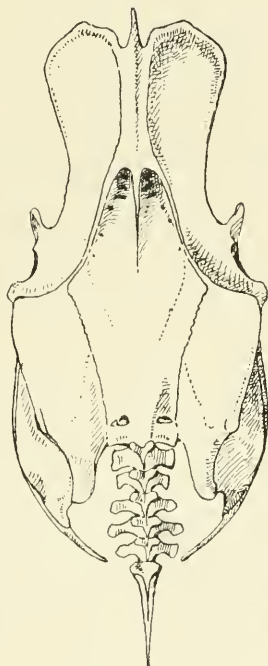
Fig. 6.



Pelvis of Hybrid Guinea-fowl.
(Dorsal aspect, $\frac{2}{3}$ nat. size.)

equally and strongly developed for the support of the ilia. The vertebral column, however, of this bird showed a feature which I have not observed in any examples of either of the species between which it is a hybrid. There were five instead of only four fused vertebræ in the dorsal region, and an additional rudimentary rib (without an uncinæ process) on

Fig. 7.



Pelvis of *Gallus bankiva*.
(Dorsal aspect, $\frac{2}{3}$ nat. size.)

the free vertebra in front of these. There were thus 8 pairs of ribs instead of 7.

The sternum (fig. 5, p. 342) is intermediate in its characters. The anterior lateral processes are broader than those of *Gallus*, but not so broad as those of *Numida*. They also tend to run parallel to the coracoids, but not to so marked an extent as in *Gallus*, nor are they so long as in that genus.

There is, as in *N. meleagris*, &c., a foramen on the upper surface of the manubrium sterni. The posterior lateral processes are again intermediate; the neck uniting the two branches of the process to the body of the sternum is wider than in *Gallus*, but not so wide as in *Numida*. The depth of the keel is suggestive of *Numida*, but its form is more like that of *Gallus*. The mode of attachment of the ribs is like that of *Gallus*; but, as already explained, *Numida meleagris* alone of the genus *Numida* also agrees with *Gallus*.

In the scapula the hook-like process of the acromion is not quite so patent as it is in *Numida*.

The pelvis (fig. 6, p. 342) is on the whole like that of *Numida*. The prepubic processes are small, and the backward projection of the ilia but little marked; there is, however,—and this is a resemblance to *Gallus* (fig. 7, p. 343)—a considerable attachment between the pubis and the ischium.

In addition to the osteology of the hybrid, I have examined the syrinx. The syrinxes of both *Gallus* and *Numida* have been described and figured by Garrod in his well-known paper upon the trachea in the Gallinaceous birds*. I need not recapitulate his descriptions, as they are accessible to every one; I may state that the syrinx of the hybrid was quite intermediate in its characters. There was a complete bony bar below, uniting the extremities of the last rings before the bifurcation; but, as in *Gallus* and *not* as in *Numida*, there were no lateral gaps between the few last tracheal rings.

XXVII.—*Birds'-nesting in and around Lucknow.*—No. III. †

By WILLIAM JESSE.

AFTER AN UNSUCCESSFUL season in 1897, owing to illness, 1898 made amends to me for previous disappointments, inasmuch as I found the nests and took the eggs of some 26 species new to me. Many of these are of course really common, and, as they had been brought to me often before and have

* P. Z. S. 1879, p. 354.

† For previous papers on the same subject see *Ibis*, 1896, p. 185, and 1897, p. 554.